

STATUS OF THE CLAIMS

Claims 1-47 were originally filed in this patent application. In the pending office action dated 11/21/2006, claims 1-47 were rejected under 35 U.S.C. §101 as being directed to non-statutory subject matter. Claims 1-6, 8-9, 11-13, 15-24, 29-30, 32-36, 38-39, 41, 43-44 and 46 were rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 6,351,742 to Agarwal *et al.* (hereinafter “Agarwal”). Claims 7, 10, 14, 25-28, 37, 42 and 47 were rejected under 35 U.S.C. §103(a) as being unpatentable over Agarwal in view of U.S. Patent No. 6,463,426 to Geppert *et al.* (hereinafter “Geppert”). No claim was allowed. In this amendment, claims 1, 6-10, 12-14, 16, 25, 29, 36, 38, 41, 43 and 46 have been amended, and claims 30-31, 39-40 and 44-45 have been cancelled. Claims 1-29, 32-38, 41-43 and 46-47 are currently pending.

REMARKS

Rejection of claims 1-47 under 35 U.S.C. §101

The examiner rejected claims 1-47 under 35 U.S.C. §101 as being allegedly directed to non-statutory subject matter. Each of these claims is addressed below.

Claims 1-15

Claim 1 has been amended herein to recite a database manager that allows entry of data into the database when the data lies within the defined range. This amendment to claim 1 makes it clear how the range constraint is utilized, as requested by the examiner. The database manager provides a useful, concrete and tangible result of allowing entry of data into the database when the data lies within the defined range. Applicants respectfully assert claim 1 as amended recites statutory subject matter under 35 U.S.C. §101, and respectfully requests reconsideration of the examiner's rejection of claims 1-15 under 35 U.S.C. §101.

Claims 16-28

In the rejection, the examiner states that claims 16-28 recite a method where there is no useful, concrete or tangible result. Claims 16-28 include three different sets of method claims, which are individually addressed below.

Claim 16 has been amended herein to recite "allowing entry of data into the selected portion of the database when the data lies within the defined range." The allowing entry of data into the selected portion of the database when the data lies within the defined range constraint is a useful, concrete and tangible result. As a result, claims 16-20 as amended define statutory subject matter under 35 U.S.C. §101.

Claim 21 as originally filed states the useful, concrete and tangible result of limiting data entry into a selected column (see preamble) by allowing entry of data into the selected column only when the data to be entered lies within the defined range. As a result, claims 21-24 define statutory subject matter under, and applicants respectfully request reconsideration of the examiner's rejection of claims 21-24 under 35 U.S.C. §101.

Claim 25 has been amended herein to recite in the preamble "A computer-implemented method for entering data into a selected column in a database table". Limitation (B) of claim 25 recites "if the data to be entered lies outside the defined range, allowing entry of data into the selected column, and in response thereto, providing a warning message." This language in claim 25 provides a useful, concrete and tangible result. As a result, claims 25-28 define statutory subject matter under, and applicants respectfully request reconsideration of the examiner's rejection of claims 25-28 under 35 U.S.C. §101.

Claims 29-47

The examiner rejected claims 29-47 for reciting "computer-readable signal bearing media." The independent claims in this group, namely claims 29, 38 and 43 have been amended herein to recite a computer-readable program product in the preamble, and to recite computer-readable recordable media in limitation (B) of these claims. In addition, claims 30-31, 39-40 and 44-45 have been cancelled. As a result, these claims are now limited to a tangible embodiment that does not include transmission media.

Claim 29 has been amended herein to recite the database manager allowing entry of data into the database when the data lies within the defined range constraint. This is a useful, concrete and tangible result. Claim 29 as amended thus defines statutory subject matter, and applicants respectfully request reconsideration of the examiner's rejection of claims 29 and 32-37 under 35 U.S.C. §101 in light of the amendment to claim 29 herein.

Claim 38 has been amended herein to recite the database manager allowing entry of data into the selected column when the data lies within the defined range. This is a useful, concrete and tangible result. Claim 38 as amended thus defines statutory subject matter, and applicants respectfully request reconsideration of the examiner's rejection of claims 38 and 41-42 under 35 U.S.C. §101 in light of the amendment to claim 38 herein.

Claim 43 has been amended herein to recite the database manager allowing entry of data into the selected column when the data lies within the defined range. This is a useful, concrete and tangible result. Claim 43 as amended thus defines statutory subject matter, and applicants respectfully request reconsideration of the examiner's rejection of claims 43 and 46-47 under 35 U.S.C. §101 in light of the amendment to claim 43 herein.

Rejection of claims 1-6, 8-9, 11-13, 15-24, 29-30, 32-36, 38-39, 41, 43-44 and 46 under 35 U.S.C. §102(b)

The examiner rejected claims 1-6, 8-9, 11-13, 15-24, 29-30, 32-36, 38-39, 41, 43-44 and 46 under 35 U.S.C. §102(b) as being anticipated by Agarwal. Each of these claims is addressed below.

Claim 1

In rejecting claim 1, the examiner reads col. 5 lines 9-19 on the range constraint recited in claim 1, which states:

... a range constraint defined for the database, the range constraint including at least one limit that is dynamically determined from data in the database; ...

The language in Agarwal cited by the examiner states:

For instance, assume that Table1 and Table2 each have 10,000 rows. Furthermore, assume that statistics have been collected for the Table1.col column, in which the values for this column range from 1 to 200 and the values in the column are uniformly distributed over this range. Also, assume that the values in the Table2.col.age attribute are uniformly distributed. Since the optimizer knows that a type attribute is in the database statement, and the optimizer further knows that the specific type attribute being referenced has a range constraint, that range constraint can be matched against the range of values in the column to determine selectivity.

The range constraint referenced in Agarwal is a traditional range constraint that provides a fixed upper limit and a fixed lower limit to define a fixed range of values that may be written to a column. For the “age” column in Agarwal, a range constraint of 1 to 100 is defined, meaning that only values from 1 to 100 are allowed in the age column. This is shown clearly at col. 5 lines 3-5 of Agarwal.

In claim 1, the range constraint includes at least one limit that is dynamically determined from data in the database. In Agarwal, the range constraint has fixed limits, namely 1 and 100. Nowhere does Agarwal teach or suggest a range constraint that has one or more limits dynamically determined from data in the database. The examiner appears to be confusing the concept of selectivity of a column that has a fixed range constraint in Agarwal with a range constraint that includes at least one limit that is dynamically determined from data in the database as recited in claim 1. In Agarwal, the selectivity of a column is determined in step 108 in FIG. 1 so the selectivity may be used to estimate costs in step 110 of different possible execution plans for a query. The determination of selectivity in Agarwal has nothing whatsoever to do with limits of a range constraint. In claim 1, the range constraint includes at least one limit that is dynamically determined from data in the database. This means that either the lower limit of 1 or the upper limit of 100 in the range constraint of 1 to 100 would have to be dynamically determined from data in the database in Agarwal. But this is not the case. Nowhere does Agarwal teach or suggest a range constraint with at least one limit that is dynamically determined from data in the database.

In addition, claim 1 has been amended herein to recite a database manager that allows entry of data into the database when the data lies within the defined range of the range constraint that includes a dynamically-determined limit. Nowhere does Agarwal teach or suggest a database manager as recited in claim 1 that allows entry of data into the database when the data lies within the range defined by a range constraint that includes a dynamically-determined limit. For the many reasons given above, claim 1 is allowable over Agarwal, and applicants respectfully request reconsideration of the examiner's rejection of claim 1 under 35 U.S.C. §102(b).

In rejecting claim 3, the examiner states Agarwal discloses the at least one limit is dynamically determined from data in the selected column, citing col. 5 lines 9-19 and col. 6 lines 11-17 of Agarwal. None of the cited portions of Agarwal teach or suggest a range constraint that has a limit dynamically determined from data in the selected column. In Agarwal, the Table2.col.age column is constrained from 1 to 100. See col. 5 line 25-26. Nowhere does Agarwal teach or suggest a range constraint with a limit dynamically determined from data in a selected column, as recited in claim 3. For Agarwal to teach the limitations in claim 3, either the 1 or 100 limits in the range constraint would have to be determined from data in the Table2.col.age column. But this is not the case in Agarwal. The range constraint in Agarwal has fixed limits that do not change and are not determined from data in the column. As a result, claim 3 is allowable over Agarwal, and applicants respectfully request reconsideration of the examiner's rejection of claim 3 under 35 U.S.C. §102(b).

In rejecting claim 4, the examiner states Agarwal discloses the at least one limit is dynamically determined from data in a column that is different than the selected column, citing col. 5 lines 9-19 of Agarwal. Footnote 1 on p. 5 of the pending office action states the selected column is Table1.col and the column that is different than the selected column is Table2.col.age. The examiner then concludes in footnote 1 "Agarwal discloses that the value of Table2.col.age is used to determine a range constraint." This assertion

by the examiner is in error. The only range constraint referenced in Agarwal is the fixed range constraint of 1 to 100 for Table2.col.age. No range constraint is discussed or referenced in Agarwal for Table1.col. For the examiner's rejection to have merit, there would have to be a range constraint defined for Table1.col with at least one limit dynamically determined from data in Table2.col.age. There is no range constraint defined for Table1.col in Agarwal. And there is no range constraint defined for any column that includes a limit dynamically determined from data in a different column. For these reasons, claim 4 is allowable over Agarwal, and applicants respectfully request reconsideration of the examiner's rejection of claim 4 under 35 U.S.C. §102(b).

In rejecting claim 5, the examiner states Agarwal teaches the at least one limit is dynamically determined by performing statistical analysis on data in the database, citing col. 5 lines 9-19 and col. 6 lines 11-17. These portions of Agarwal discuss collected statistics for Table2.col that may be used to calculate selectivity. Applicants admit that selectivity is a type of statistical analysis in the database. However, the computed selectivity in step 108 in FIG. 1 of Agarwal is used to estimate costs in step 110 of possible execution plans for a query. The selectivity in Agarwal has nothing to do with limits of a range constraint. Nowhere does Agarwal teach or suggest at least one limit of a range constraint is dynamically determined by performing statistical analysis on data in the database. For this reason, claim 5 is allowable over Agarwal, and applicants respectfully request reconsideration of the examiner's rejection of claim 5 under 35 U.S.C. §102(b).

In rejecting claim 6, the examiner states Agarwal teaches the database manager recited in claim 6, citing col 5 lines 3-5. Claim 6 recites:

6. The apparatus of claim 1 wherein the range constraint defines a range that includes the at least one limit, and wherein the database manager allows entry of data into the database when the data lies within the defined

range and does not allow entry of data into the database when the data lies outside the defined range.

Note “the at least one limit” referenced in claim 6 is dynamically determined from data in the database as recited in claim 1. The only range constraint in Agarwal is the fixed range constraint from 1 to 100 for Table2.col.age. Nowhere does Agarwal teach or suggest a database manager that determines whether or not to enter data into the database based on a range constraint that has at least one limit that is dynamically determined from data in the database. For this reason, claim 6 is allowable over Agarwal, and applicants respectfully request reconsideration of the examiner’s rejection of claim 6 under 35 U.S.C. §102(b).

The other independent claims, namely claims 8, 12, 16, 21, 25, 29, 38 and 43, all include limitations similar to those in claim 1, and are therefore all allowable for the same reasons given above for claim 1.

Claims 2, 17 and 32 depend on claims 1, 16 and 29, respectively, which are allowable for the reasons given above. As a result, claims 2, 17 and 32 are allowable as depending on allowable independent claims.

Claims 18, 22, 26 and 33 include limitations similar to those in claim 3, and are therefore all allowable for the same reasons given above for claim 3.

Claims 19, 23, 27 and 34 include limitations similar to those in claim 4, and are therefore all allowable for the same reasons given above for claim 4.

Claims 11, 15, 20, 24, 28 and 25 include limitations similar to those in claim 5, and are therefore all allowable for the same reasons given above for claim 5.

Claims 9, 13, 36, 41 and 46 include limitations similar to those in claim 6, and are therefore all allowable for the same reasons given above for claim 6.

Claims 30, 39 and 44 have been cancelled herein, and therefore need not be addressed.

Rejection of claims 7, 10, 14, 25-28, 37, 42 and 47 under 35 U.S.C. §103(a)

The examiner rejected claims 7, 10, 14, 25-28, 37, 42 and 47 under 35 U.S.C. §103(a) as being unpatentable over Agarwal in view of Geppert. Each of claims 7, 10, 14, 25-28, 37, 42 and 47 depend on an allowable independent claim. As a result, all of claims 7, 10, 14, 25-28, 37, 42 and 47 are allowable as depending on allowable independent claims.

Conclusion

In summary, none of the cited prior art, either alone or in combination, teach, support, or suggest the unique combination of features in applicants' claims presently on file. Therefore, applicants respectfully assert that all of applicants' claims are allowable. Such allowance at an early date is respectfully requested. The Examiner is invited to telephone the undersigned if this would in any way advance the prosecution of this case.

Respectfully submitted,

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